



Aquifer Exemptions

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- Key Principles of the Safe Drinking Water Act (SDWA) and the Underground Injection Control (UIC) Program
- Background on Aquifer Exemptions
- Roles and Responsibilities
- EPA Review of AE Requests
- Consistency and predictability in the AE review process
 - EPA's Policy Memorandum and Checklist
- Basis for exemption and EPA's assessment

The Safe Drinking Water Act



SDWA and the Underground Injection Control Program are designed to prevent endangerment of underground drinking water sources

(SDWA 1421(b))

Definition (40 CFR 144.3)

- *Underground source of drinking water (USDW)* means an aquifer or its portion:
 - (a)(1) Which supplies any public water system; or
 - (2) Which contains a sufficient quantity of ground water to supply a public water system; and
 - (i) Currently supplies drinking water for human consumption; or
 - (ii) Contains fewer than 10,000 mg/l total dissolved solids; and
 - (b) Which is not an exempted aquifer.
- All USDWs are required to be protected by the UIC program

Background on AEs



- AEs allow injection into an aquifer which would otherwise be prohibited by the UIC program.
- AEs have been primarily used to allow mineral, hydrocarbon, or geothermal energy production.
- AEs are considered a program revision and therefore require EPA review and approval.
- EPA has final responsibility for AE decisions, even if a state has primacy for the UIC program.
- In approving an Aquifer Exemption, EPA makes a determination that the proposed exemption area is not currently being used as a source of drinking water and will not be used as a source of drinking water in the future.
- The AE provisions in EPA's regulations ensure that no current user of the aquifer will lose his/her water supply.
- The scrutiny on EPA's rationale and consistency in decision making is rising⁴, especially if there are drinking water wells nearby.

Roles & Responsibilities



Owners/Operators:

- Owners/Operators submit a request for an AE to primacy agency

States/Tribes:

- States or tribes with primacy will review the request and determine whether to submit to EPA

EPA:

- The EPA Region evaluates the application and responds by letter to the state
- If EPA has Direct Implementation of the UIC program in a state, it will review the application directly from the applicant
- The final determination should be documented in a Statement of Basis that explains the factual, technical, and legal bases for the determination.
- EPA HQ will offer support to EPA Regions for substantial or complex requests and to promote national consistency.



- Two sections of the federal UIC regulations address the evaluation and review of AE requests by EPA:
 - (1) 40 CFR 144.7 – allows the UIC Program Director to identify aquifers or portions of aquifers that are exempt from the definition of a USDW and describes how such exempted areas of aquifers would be delineated.
 - (2) 40 CFR 146.4 – once an area to be exempted is identified, 146.4 provides the criteria by which the aquifer is evaluated to determine if exemption is appropriate.

Aquifer Exemptions: Criteria for Exemptions (40 CFR 146.4)



- (a) It does not currently serve as a source of drinking water; and***
- (b) It cannot now and will not in the future serve as a source of drinking water*** because:
- (1) It is mineral, hydrocarbon or geothermal energy producing, or can be demonstrated by a permit applicant as part of a permit application for a Class II or III operation to contain minerals or hydrocarbons that considering their quantity and location are expected to be commercially producible.***
 - (2) It is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical;***
 - (3) It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption; or***
 - (4) It is located over a Class III well mining area subject to subsidence or catastrophic collapse; or***
- (c) The total dissolved solids content of the ground water is more than 3,000 and less than 10,000 mg/l and it is not reasonably expected to supply a public water system***

Aquifer Exemptions

EPA Guidance 34



- EPA developed Guidance 34 (January 9, 1984) to address UIC program revisions, either in response to primacy applications or aquifer exemptions that require a program revision.
- Guidance 34
 - Supplements the rule criteria at 146.4 by discussing specific considerations associated with the criteria.
 - Provides guidelines for reviewing AE requests (Attachment 3 of Guidance 34).
 - Describes the concept of substantial and non-substantial program revision and addresses review and approval of non-substantial program revisions which are the responsibility of the Regional Administrator.
 - Discusses evaluation criteria to demonstrate current use of aquifer as source of drinking water, including survey of the proposed exempted area to identify any water supply wells which tap the proposed exempted aquifer.
 - Clarifies that the area to survey should cover the proposed exempted area and a buffer zone which should extend a minimum of $\frac{1}{4}$ of a mile from the boundary of the exempted area.



When is an Aquifer Exemption considered to be Substantial?

An exemption request is considered to be substantial if it is:

- For an aquifer containing water of less than 3,000 mg/l TDS which is:
 - related to any Class I well; or
 - not related to action on a permit, except in the case of Class II enhanced recovery operations authorized by rule
- All requests for expansions to the areal extent of Class II enhanced oil or enhanced gas recovery aquifer exemptions for Class VI wells

Timing



- The UIC regulations allow for Aquifer Exemption requests to be submitted to EPA for a determination either:
 - As part of the State's submission for primacy of the UIC program; or
 - Subsequent to program approval or promulgation after public notice and opportunity for a public hearing.
- The Director must use the criteria found at 40 CFR 146.4 and in EPA UIC Guidance 34 when making their determination to a request that an Aquifer Exemption be granted
- Upon receipt of an exemption request, EPA compiles and reviews the information used to support the Aquifer Exemption request and may seek additional information from the state and/or other sources

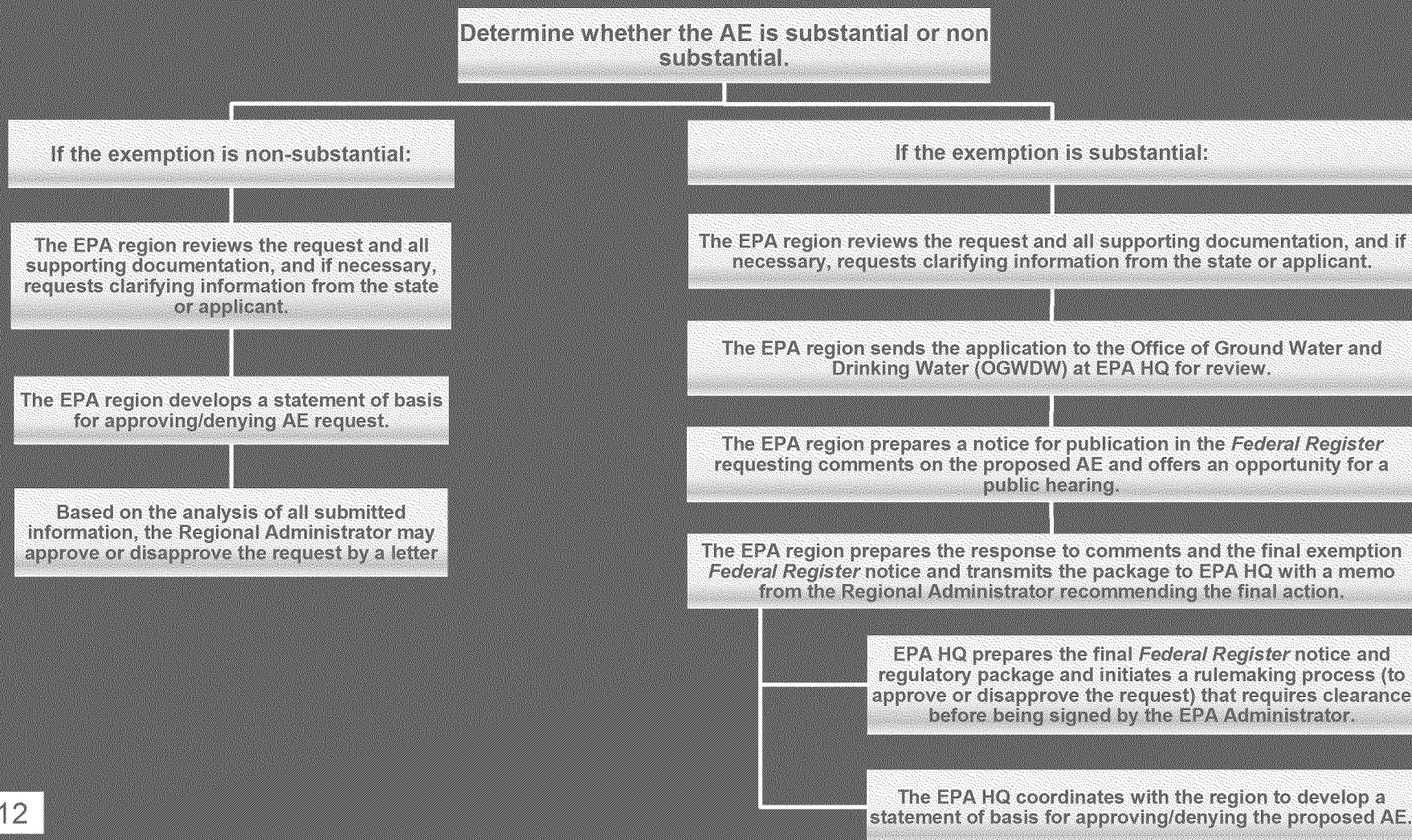


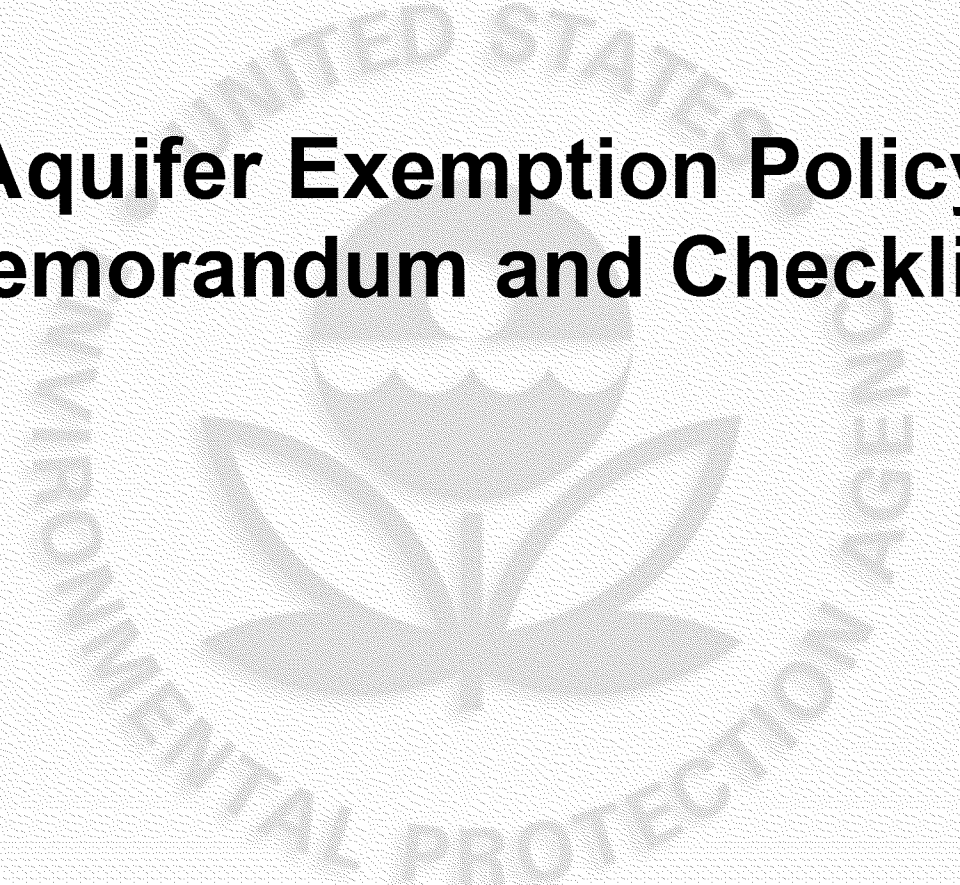
- EPA then documents its evaluation and analysis of the information EPA considered in making the determination to approve or deny the Aquifer Exemption request in a Statement of Basis
- The designation of an aquifer as being exempted is not final until it has been approved by EPA
- Consideration of aquifer exemption requests submitted under the criterion in 40 CFR 146.4(c)
 - (c) The total dissolved solids content of the ground water is more than 3,000 and less than 10,000 mg/l and it is not reasonably expected to supply a public water system

EPA shall approve or disapprove the request within 45 days of submittal by the State [see 40 CFR 144.7(b)(3)]

- Aquifer exemption requests submitted to EPA under criteria in 40 CFR 146.4(b) do not have a 45-day deadline for action.

EPA Process of Receiving and Reviewing AE Requests



The background features a large, faint, circular watermark of the United States Environmental Protection Agency (EPA) seal. The seal contains a stylized flower with three leaves and a scalloped center, surrounded by the text "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY".

Aquifer Exemption Policy Memorandum and Checklist

Aquifer Exemptions Need for Consistency



- Over the last several years, EPA identified the need to provide national consistency and additional clarity on the AE review and determination process
 - Increased public attention around ground water use and protection efforts and water scarcity and drought is impacting many areas of the country
 - A few recent proposed exemptions are in close vicinity to drinking water wells
 - A law suit against EPA on its recent approval of an aquifer exemption request
 - A recent discovery of injection activities taking place in aquifers that were not exempt
 - States' claim of EPA late engagement in the process, which can significantly upset the state planning process
 - An industry request for EPA to communicate early on in the process
- EPA HQ engaged its regional staff, Water Division Directors and a number of key states which participated in a work group organized by the Ground Water Protection Council (GWPC), to help bring greater clarity to the needs and expectations of EPA and states in approving AE requests.
- The key AE process improvements discussed with the states informed the policy memorandum.
- Informed by discussions with the states and its regions, EPA recently issued a memorandum to its Regional Water Division Directors, along with a checklist for the aquifer exemption review process, to help bring greater clarity to the needs and expectations of EPA and states in approving AE requests.

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The Policy Memorandum



Key points

- Provides consistency and predictability in the AE review process.
- Introduces a checklist for the AE approval process to be shared with state programs.
- Highlights factors that are likely to make AE requests more complex (including in particular, nearby drinking water wells).
- Suggests early consultation between EPA regions and states to discuss key AE issues likely to make the request complex.
- Clearly articulates that EPA's consideration of current underground sources of drinking water recognizes ground water movement.
- Suggests course for dispute resolution with states if needed.

Aquifer Exemptions

The Checklist



Purpose

- Promotes national consistency on the review process.
- Ensures that appropriate and adequate information is collected to facilitate review of AE requests, and documentation of AE decisions.
- Is not a “one size fit all” document as some information described in it may not apply to all AE requests.
- Facilitates discussions between EPA regions and applicants (DI) or states and helps manage expectations.
- Helps with EPA’s documentation of its review and decision on the request, to inform a statement of basis to be included in the Agency’s record of final action.
- Provides a mechanism of consistent data collection for a robust, standardized recordkeeping and data mapping.

Current Source Assessment



- What constitutes an aquifer that currently serves as a source of drinking water per 40 CFR 146.4(a) i.e., Does the aquifer or its portion proposed for exemption currently serve as source of drinking water?
- EPA first needs to determine whether any drinking water well (both public and private) either exists within the proposed exempted area, or for which the proposed exempted portion of the aquifer might be a source of drinking water.
 - If there are drinking water wells within or in close proximity to the proposed exempted area:
 - a capture zone analysis may be required
 - EPA's evaluation is based on the capture zone of the well – i.e., the volume of the aquifer(s) or portion(s) thereof from within which groundwater is expected to be captured by that well during the life of the well.
 - *If any public or private drinking water wells or springs are (or will over the lifetime of the well) capturing or producing drinking water from ore-bearing aquifers within the proposed exemption area, then the aquifer currently serves as a source of drinking water.*

Future Use Assessment



What key factors to consider when demonstrating that an aquifer cannot now and will not in the future serve as a source of drinking water per 40 CFR 146.4(b), or that an aquifer is not reasonably expected to supply a public water system per 40 CFR 146.4(c)?

- Mineral, hydrocarbon, or geothermal producing
- Likelihood that the water in the exempted area would need to be used as a drinking water source in the future.
- Remoteness / Low Population.
- Availability of alternative water supplies to satisfy future drinking water needs
 - Population projections and growth
 - Future demand in the area
 - Alternative water supply in the area
- Available treatment or drilling technologies.
- Cost of obtaining drinking water from deeper aquifers.



Assessment under §146.4(b)(1)

Regulation Language: “An aquifer cannot now and will not in the future serve as a source of drinking water because it is mineral, hydrocarbon, or geothermal energy producing or can be demonstrated by a permit application as part of a permit application for a Class II or III operation to contain minerals or hydrocarbons that considering their quantity and location are expected to be commercially producible.”

An Aquifer Exemption request under this section should discuss:

- Production history of the well if it is a former production well which is being converted
- Description of any drill stem tests run on the horizon, with amount of oil and water produced during the test
- Production history of other wells in the vicinity which produce from the horizon
- Description of any enhanced recovery operations including the number and location of wells
- To expand an existing well field to recover hydrocarbons the applicant should show that the exemption request is for expanding the previously exempted aquifer and provide data supporting the expectation that there are commercially producible quantities of hydrocarbons within the expanded area



Assessment under §146.4(b)(2)

Regulation Language: “An aquifer cannot now and will not in the future serve as a source of drinking water because it is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical.”

The economic evaluation, submitted by the applicant, should include/consider:

- Distance from the proposed exempted aquifer to public water supplies
- Current sources of water supply for potential users of the proposed exempted aquifer
- Availability and quality of alternative water supply sources
- Analysis of future water supply needs within the general area
- Depth of proposed exempted aquifer
- Quality of the water in the proposed exempted aquifer



Assessment under §146.4(b)(3)

Regulation Language: “An aquifer cannot now and will not in the future serve as a source of drinking water because it is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption.”

An Aquifer Exemption request under this section should discuss:

Technical considerations:

- Concentrations and types of contaminants in the aquifer
- Source of contamination
- Whether contamination source has been abated
- Extent of contaminated area
- Probability that contaminant plume will pass the through proposed exempted area
- Ability of treatment to remove contaminants from ground water
- Chemical content of proposed injected fluids

Economic considerations:

- Current water supplies in the area
- Alternative water supplies
- Costs to develop current and probable future water supplies
- Cost to develop a water supply from the proposed exempted aquifer:
 - Well construction costs, transportation costs, water treatment costs
- Projections on future use of the proposed aquifer



Assessment under §146.4(c)

Regulation Language: “The Total Dissolved Solids content of the ground water is more than 3,000 and less than 10,000 mg/l and it is not reasonably expected to supply a public water system.”

An Aquifer Exemption request under this section should discuss:

- Information about current water quality and availability
- Current sources of public water supply in the area
- Discussion of the future adequacy of current water supply, including:
 - Population projections
 - Economic projections
- Other available water supply sources and quantity within the area
- Potential technologies for treating contaminant(s)



Questions??

Thank You!